BRUHAT BANGALORE MAHANAGARA PALIKE
BYTARAYANPURA DIVISION

Name of Work: Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division

6th & FINAL BILL

TEST REPORTS

TEJUS CONSULTANTS
CONSULTING ENGINEERS AND DESIGNERS
No.58 MIG, 6th Cross, 3rd Main
1st Stage, Basaveshwaranagar
Bangalore-560079
☎ 080 - 23287532
email: tejusconsultants@gmail.com

TEJUS
CONSULTANTS

No. TC / BBMP / RI / BYT-PMC / 400 / 18 – 19 Date:

To
The Executive Engineer,
Bruhat Bangalore Mahanagara Palike,
Byatarayanapura Division,

Dear Sir

Sub: **Sixth and Final bill for the work of (as per sanctioned estimate): Comprehensive Development for Roads and Drains in Ward No. 7 and 8 under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, and Byatarayanapura Division**

In reference to the above subject, this is to bring to your kind notice that we have scrutinized the **Sixth and Final Bill** submitted by M/s.Ram and Company Sri.C.R Girish No12, Patel Pillegowda layout, Ramchandrapura, Bangalore-560013, towards the above said work and arrived at an amount of **Rs. 1609019.00/-(Rupees Sixteen Lakh Nine Thousand Nineteen Only).** The work has been completed satisfactorily

This is for your kind information.

Thank you and assuring you the best of our Services at all the times

For Tejus Consultants
(Nischal M)

TEJUS
CONSULTANTS

TEST REPORT	
Clients	Bruhat Bangalore Mahanagara Palike
Project	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division.
Consultants	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	M/s.Ram and Company
Total Weight in gr	3000

SIEVE ANALYSIS

Type of Material	40 mm down size	Proposed Use	PCC
Sample Location	At Site	Date of Sampling	24-10-19
		Date of Testing	24-10-19

IS Sieve Size	Weight Retained in gm	Cum. Weight Retained in gm	Cumulative Weight Retained in %	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA-2007) % of Passing For Graded Aggregate of Nominal Size
80.00mm	0	0	0.00	100.00	100
63.00mm	0	0	0.00	100.00	-
40.00mm	110	110	3.67	96.33	95-100
20.00mm	1500	1610	53.67	46.33	30-70
10.00mm	650	2260	75.33	24.67	10-35
4.75mm	640	2900	96.67	3.33	0-5
Pan	100	3000	100.00	0.00	

Remarks : Satisfactory / Not Satisfactory

Consultant's Representative

TEJUS CONSULTANTS

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

M/s. RAM & COMPANY

TEJUS
CONSULTANTS

Test Report on Cement				
Project	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division.			
Client	Bruhat Bangalore Mahanagar Palike			
Consultant	TEJUS CONSULTANTS			
Contractor	M/s.Ram and Company			
Sample ID	Cement			
Date of Sample Tested	24-10-19			
Sample Supplied By	Agency			
Sl.No.	**Descriptions**	**Test Method as per IS**	**Test Result**	**Requirements as per IS: 12269-1987**
1	a) Initial Setting Time	IS-4031 (Part-5)	38 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part-5)	400 Minutes	Not More than 600 Minutes
2	Soundness	IS-4031 (Part-3) By the Le-Chatelier method	5 mm	Not More than 10 mm
3	Standard Consistency	IS-4031 (Part-4)	28.00%	

TEJUS CONSULTANTS

Ashok.N.D
AE(Ret)

RAM & COMPANY

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

TEJUS
CONSULTANTS

TEST REPORT

Clients	BRUHAT BENGALORE MAHANAGARA PALIKE
Project	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division.
Consultants	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	M/s.Ram and Company

SPECIFIC GRAVITY AND WATER ABSORPTION
FINE AGGREGATE (IS-2386-PART-3)

Type of Material	Sand/M sand	Proposed Use	PCC
Location/Source	At Plant/site	Date of Sampling	24-10-19
Period of Soaking	24 hours	24-10-19	24-10-19

Sl. No.	Test Property		TRIAL - 1	24-10-19	TRIAL - 3	Average
A	Weight of sturated surface dry sample gm.		690	685	690	
B	Weight of oven - dry sample gm.		681	676	681	
C	Weight of Pycnometer Filled with water gm		1275	1275	1275	
D	Weight of Pycnometer + sample + water gm		1708	1708	1707	
E	Bulk specific gravity	B / (C + A - D)	2.650	2.683	2.640	**2.657**
G	Absorption (%)	(A - B) *100 / B	1.322	1.331	1.322	**1.325**

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

TEJUS CONSULTANTS
No. 36 Girdhman, 6th Cross, 1st Stage KHB Colony, Basaveshwaranagar, Bangalore - 560079, O : +91 80 23287532, tejusconsultants@gmail.com

TEJUS
CONSULTANTS

TEST REPORT	
Clients	BRUHAT BENGALORE MAHANAGARA PALIKE
Project	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division.
Consultants	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	M/s.Ram and Company

SIEVE ANALYSIS

Total Weight:	**3000** gms				
Type of Material	**Fine aggregate (River Sand/M sand)**		**Proposed Use**	PCC	
Sample Location	At Plant/site		**Date of Sampling**	24-10-19	
			Date of Testing	24-10-19	
IS Sieve Size	**Weight Retained**	**Cum. Weight Retained**	**Cum. % Retained**	**Cum. % Passing**	**Spec. Limit (%) Passing (Zone-II)**
10.00 mm	0	0	0	100.00	100
4.75 mm	210	210	7.00	93.00	90 - 100
2.36 mm	290	500	16.67	83.33	75 - 100
1.18 mm	530	1030	34.33	65.67	55 - 90
0.600 mm	490	1520	50.67	49.33	35 -59
0.300 mm	630	2150	71.67	28.33	8-30
0.150 mm	590	2740	91.33	8.67	0 - 10
Pan	260	3000			-

Remarks : ✓ Satisfactory / Not Satisfactory

AE(Ret)

M/s. RAM & COMPANY

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

TEJUS CONSULTANTS

Consultant's Representative

TEJUS
CONSULTANTS

Test Report on Cement				
Project	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division.			
Client	Bruhat Bangalore Mahanagar Palike			
Consultant	TEJUS CONSULTANTS			
Contractor	M/s.Ram and Company			
Sample ID	Cement			
Date of Sample Tested	28-10-19			
Sample Supplied By	Agency			
Sl.No.	**Descriptions**	**Test Method as per IS**	**Test Result**	**Requirements as per IS: 12269-1987**
1	a) Initial Setting Time	IS-4031 (Part-5)	38 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part-5)	385 Minutes	Not More than 600 Minutes
2	Soundness	IS-4031 (Part-3) By the Le-Chatelier method	4mm	Not More than 10 mm
3	Standard Consistency	IS-4031 (Part-4)	28.00%	

Consultant Representative

AE(QC)

RAM & COMPANY

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

TEJUS
CONSULTANTS

TEST REPORT		
Clients	Bruhat Bangalore Mahanagara Palike	
Project	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division.	
Consultants	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore	
Contractor	M/s.Ram and Company	
Total Weight:	10000	gms

SIEVE ANALYSIS

Type of Material	12.5 mm down size		Proposed Use	Concrete	
Sample Location	Plant		Date of Sampling	28-10-19	
			Date of Testing	28-10-19	
IS Sieve Size (in mm)	Weight Retained	Cum. Weight Retained	Cum. % Retained	Cum. % Passing	Spec. Limit (%) Passing
20.0	0	0	0	100	100
12.5	595	595	5.95	94.05	90-100
10.0	3365	3960	39.60	60.40	40-85
4.75	5500	9460	94.60	5.40	0-10
Pan	540	10000			

Remarks : ✓ Satisfactory / Not Satisfactory

AE(HQ)

M/s. RAM & COMPANY

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

TEJUS CONSULTANTS

Consultant's Representative

TEJUS
CONSULTANTS

TEST REPORT					
Clients	Bruhat Bangalore Mahanagara Palike				
Project	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division.				
Consultants	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore				
Contractor	M/s.Ram and Company				
Total Weight:	10000	gms			
SIEVE ANALYSIS					
Type of Material	20 mm down size		**Proposed Use**	Concrete	
Sample Location	At Plant		**Date of Sampling**	28-10-19	
			Date of Testing	28-10-19	
IS Sieve Size	**Weight Retained**	**Cum. Weight Retained**	**Cum. % Retained**	**Cum. % Passing**	**Spec. Limit (%) Passing**
40.00 mm	0	0	0	100	**100**
20.00 mm	275	275	2.75	97.25	**95 - 100**
10.00 mm	4780	5055	50.55	49.45	**25 - 55**
4.75 mm	4360	9415	94.15	5.85	**0 - 10**
Pan	585	10000			
Remarks :	✓ Satisfactory / Not Satisfactory				

Consultant's Representative

TEJUS CONSULTANTS

A.N.D
AE(Ltd)

RAM & COMPANY

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

TEJUS
CONSULTANTS

TEST REPORT	
Clients	BRUHAT BENGALORE MAHANAGARA PALIKE
Project	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division.
Consultants	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	M/s.Ram and Company

SPECIFIC GRAVITY AND WATER ABSORPTION
FINE AGGREGATE (IS-2386-PART-3)

Type of Material	**Sand/M sand**	**Proposed Use**	Concrete
Location/Source	**At Plant/site**	**Date of Sampling**	28-10-19
Period of Soaking	**24 hours**	**Date of Testing**	28-10-19

Sl. No.	Test Property		TRIAL - 1	TRIAL - 2	TRIAL - 3	Average
A	Weight of sturated surface dry sample gm.		671	653	680	
B	Weight of oven - dry sample gm.		662	645	672	
C	Weight of Pycnometer Filled with water gm		1275	1275	1275	
D	Weight of Pycnometer + sample + water gm		1700	1685	1700	
E	Bulk specific gravity	B	2.691	2.654	2.635	**2.660**
		(C + A - D)				
G	Absorption (%)	(A - B) *100	1.360	1.240	1.190	**1.263**
		B				

TEJUS CONSULTANTS

M/s. RAM & COMPANY

Assistant Executive Engineer.
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

TEJUS
CONSULTANTS

TEST REPORT	
Clients	Bruhat Bangalore Mahanagara Palike
Project	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division.
Consultants	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	M/s.Ram and Company

SIEVE ANALYSIS

Total Weight:	**3000** gms				
Type of Materia	**Fine aggregate (River Sand/M sand)**		**Proposed Use**	Concrete	
Sample Location	At Plant/site		**Date of Sampling**	28-10-19	
			Date of Testing	28-10-19	
IS Sieve Size	**Weight Retained**	**Cum. Weight Retained**	**Cum. % Retained**	**Cum. % Passing**	**Spec. Limit (%) Passing (Zone-II)**
10.00 mm	0	0	0	100.00	**100**
4.75 mm	230	230	7.67	92.33	**90 - 100**
2.36 mm	280	510	17.00	83.00	**75 - 100**
1.18 mm	520	1030	34.33	65.67	**55 - 90**
0.600 mm	545	1575	52.50	47.50	**35 -59**
0.300 mm	665	2240	74.67	25.33	**8-30**
0.150 mm	513	2753	91.77	8.23	**0 - 10**
Pan	247	3000			**-**
Remarks :			✓ Satisfactory / Not Satisfactory		

Consultant's Representative

M/s. RAM & COMPANY

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P
Bangalore.

TEJUS
CONSULTANTS

Test report on Compressive strength of concrete cubes								
Project	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division.							
Client	Bruhat Bangalore Mahanagar Palike							
Consultant	TEJUS CONSULTANTS							
Contractor	M/s.Ram and Company							
Grade of concrete:	M20							
Size of cube:	150x150x150 mm							
Reference IS code:	IS:516-1959							
Sl.No.	Date of Casting	Date of testing	Age of Test	Weight of Cube	Area of Cube	Failure load	Compressive strength	Avg. Compressive strength
				Kg	mm^2	KN	N/mm^2	N/mm^2
1	28-10-19	04/11/19	7 days	8.590	22500	299	13.29	13.33
2	28-10-19	04/11/19	7 days	8.710	22500	303	13.47	
3	28-10-19	04/11/19	7 days	8.560	22500	298	13.24	

TEJUS CONSULTANTS

M/s. RAM & COMPANY

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

TEJUS
CONSULTANTS

Test report on Compressive strength of concrete cubes								
Project	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants,							
Client	Bruhat Bangalore Mahanagar Palike							
Consultant	TEJUS CONSULTANTS							
Contractor	M/s.Ram and Company							
Grade of concrete:	M20							
Size of cube:	150x150x150 mm							
Reference IS code:	IS:516-1959							
Sl.No.	Date of Casting	Date of testing	Age of Test	Weight of Cube	Area of Cube	Failure load	Compressive strength	Avg. Compressive strength
				Kg	mm^2	KN	N/mm^2	N/mm^2
1	28-10-19	25-11-19	28 days	8.826	22500	456	20.27	20.36
2	28-10-19	25-11-19	28 days	8.860	22500	458	20.36	
3	28-10-19	25-11-19	28 days	8.710	22500	460	20.44	

TEJUS CONSULTANTS

M/S. RAM & COMPANY

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

TEJUS
CONSULTANTS

PRECAST SLAB (CORE) TEST REPORT

Client	:	Bruhat Bangalore Mahanagara Palike
Contractor	:	M/s.Ram and Company
Name of Work	:	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division.
No.of Sample Tested	:	3
Date of Testing	:	05/11/19
Technical Reference	:	IS:516-1959 (Reaffirmed 1999), SP-24:1983.
Grade of Concrete	:	M_{20} - 100mm thick

Sl.No.	Dia of Core D (mm)	Height of Core H (mm)	Core Wt (Kg)	Density of Core (kg / m^3)	H / D	Correction factor (Based on H/D)	Failure Load (kN)	Core Strength (N/mm^2)	Correction Factor for the Dia. (Strength of the Core x 1.08)	Corrected Cylinder Compressive Strength (N/mm^2)	Equivalent Cube Compressive Strength (N/mm^2)
1	50.00	90.00	0.461	2608.73	1.80	0.960	38.25	19.48	21.04	20.20	25.25
2	50.00	90.00	0.464	2625.70	1.80	0.960	38.40	19.56	21.12	20.28	25.35
3	50.00	90.00	0.463	2620.04	1.80	0.960	38.25	19.48	21.04	20.20	25.25

Note:

1. The report shall not be reproduced, except in full, without the written approval of the laboratory.
2. The results indicated above are based on the tests carried out on the samples received in the laboratory.
3. Any Query regarding the report must be reported reported within 15days from the date of testing.

AE(HQ)

RAM & COMPANY

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

TEJUS CONSULTANTS

Consultant's Representative

TEJUS
CONSULTANTS

PRECAST SLAB (CORE) TEST REPORT

Client	:	Bruhat Bangalore Mahanagara Palike
Contractor	:	M/s.Ram and Company
Name of Work	:	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division.
No. of Sample Tested	:	3
Date of Testing	:	05/11/19
Technical Reference	:	IS:516-1959 (Reaffirmed 1999), SP-24:1983.
Grade of Concrete	:	M_{20} - 250mm Thick

Sl. No.	Dia of Core D (mm)	Height of Core H (mm)	Core Wt (Kg)	Density of Core (kg / m^3)	H / D	Correction factor (Based on H/D)	Failure Load (kN)	Core Strength (N/mm^2)	Correction Factor for the Dia. (Strength of the Core x 1.08)	Corrected Cylinder Compressive Strength (N/mm^2)	Equivalent Cube Compressive Strength (N/mm^2)
1	100.00	180.00	3.560	2518.18	1.80	0.960	159.00	20.24	21.86	20.99	26.24
2	100.00	180.00	3.570	2525.26	1.80	0.960	159.50	20.31	21.93	21.06	26.32
3	100.00	180.00	3.580	2532.33	1.80	0.960	160.00	20.37	22.00	21.12	26.40

Note:
1. The report shall not be reproduced, except in full, without the written approval of the laboratory.
2. The results indicated above are based on the tests carried out on the samples received in the laboratory.
3. Any Query regarding the report must be reported reported within 15 days from the date of testing.

TEJUS CONSULTANTS

Consultant's Representative

N.D
AE(W7)

M/s. RAM & COMPANY

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

TEJUS
CONSULTANTS

AGGREGATE IMPACT VALUE
(IS: 2386 Part - 4)

Project	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division		
Client	BRUHAT BANGALORE MAHANAGARA PALIKE		
Consultant	M/s Tejus Consultants		
Contractor	M/S Ram and Company, Engineers & Contractors.		
Proposed Use	WMM	**Date of Sampling**	**12/11/2019**
Sample Location	**At plant**	**Date of Testing**	**12/11/2019**

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	360.00	350.00	380.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	271.00	260.00	279.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	89.00	90.00	101.00	
4	Aggregate Impact Value (%)	(Wc/Wa)* 100	24.72	25.71	26.58	
5	Average Aggregate impact value	(%)	25.67			Max - 30 %

Remarks : ✓ Satisfactory / Not Satisfactory

Note:
1. The report shall not be reproduced, except in full, without the written approval of the laboratory.
2. The results indicated above are based on the tests carried out on the samples received in the laboratory/Site.
3. Any Query regarding the report must be reported reported within 15days from the date of testing.

Authorised Signatory

M/s. RAM & COMPANY

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

TEJUS
CONSULTANTS

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Project	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division
Client	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	M/s Tejus Consultants
Contractor	M/S Ram and Company, Engineers & Contractors.

Type of Material	WMM	**Proposed Use**	WMM
Sample Location	At plant	**Date of Sampling**	12/11/2019
		Date of Testing	12/11/2019

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	850	70	780	60
16.0	12.5	1260	110	1150	120
12.5	10.0	480	80	400	62
10.0	6.3	452	68	384	38
Total		**3042**	**328**	**2714**	**280**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.78
Elongation Index(%):	10.32
Combined FI+EL (%)	21.10

Note:
1. The report shall not be reproduced, except in full, without the written approval of the laboratory.
2. The results indicated above are based on the tests carried out on the samples received in the laboratory/Site.
3. Any Query regarding the report must be reported reported within 15days from the date of testing.

Authorised Signatory

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

TEJUS
CONSULTANTS

GRADATION FOR WMM
(As per MORT&H 400-11)

Name of Work	:	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division
Client	:	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	:	M/s Tejus Consultants
Contractor	:	M/S Ram and Company, Engineers & Contractors.
Date of Testing	:	**12/11/2019**
Type of Mix	:	WMM
Sample I/D	:	WMM 1

Sample Location:	At plant	**Date of Sampling:**	**12/11/2019**
Type of material & Purpose:	WMM	**Date of testing:**	**12/11/2019**
		Oven Dry Wt.(gms):	10000.0

IS Sieve size in mm	Weight retained (gm)	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	250	250	2.50	97.50	95-100
22.4	2530	2780	27.80	72.20	60-80
11.2	1790	4570	45.70	54.30	40-60
4.75	1800	6370	63.70	36.30	25-40
2.36	1360	7730	77.30	22.70	15-30
0.6	870	8600	86.00	14.00	8.0-22.0
0.075	750	9350	93.50	6.50	0-8
Pan	650				
Total	10000				

Note:
1. The report shall not be reproduced, except in full, without the written approval of the laboratory.
2. The results indicated above are based on the tests carried out on the samples received in the laboratory/Site.
3. Any Query regarding the report must be reported reported within 15days from the date of testing.

TEJUS CONSULTANTS

Authorised Signatory

M/S RAM & COMPANY

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

TEJUS
CONSULTANTS

Project	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division
Client	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	M/s Tejus Consultants
Contractor	M/S Ram and Company, Engineers & Contractors.

Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)

Date of Testing	**20-11-19**
Layer no. or level	WMM I layer
Depth of hole	250mm

Field density:	**1**	**2**	**3**
Wt. of wet material from hole (Ww) gms.	6165	6110	6205
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9737	9731	9717
Wt. of sand in cone (w3) gms.	836	842	830
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3427	3427	3453
Bulk density of sand (ys)gm/cc	1.31	1.32	1.31
Bulk density of material(i.e. wt. of the wet material) (yb)=(Ww/w4*(ys))gm/cc	2.36	2.35	2.35
Moisture meter reading(moisture content)	12.45	12.56	12.57
Result			
FDD(Wt.of the dry material)=(100yb/100+mc)gm/cc	2.10	2.09	2.09
MDD	2.13	2.13	2.13
OMC	12.60%	12.60%	12.60%
% of Compaction Obtained	98.39	98.16	98.18
Compaction Required	98%	98%	98%

Note:
1. The report shall not be reproduced, except in full, without the written approval of the laboratory.
2. The results indicated above are based on the tests carried out on the samples received in the laboratory/Site.
3. Any Query regarding the report must be reported reported within 15days from the date of testing.

Authorised Signatory

AE(Tech)

Assistant Executive Engineer
Kodigenalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

TEJUS CONSULTANTS
No. 58, 3rd main, 6th Cross, 1st Stage KHB Colony, Basaveshwaranagar, Bangalore - 560079, O : +91 80 23287532, tejusconsultants@gmail.com

TEJUS
CONSULTANTS

Project	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division
Client	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	M/s Tejus Consultants
Contractor	M/S Ram and Company, Engineers & Contractors.

AGGREGATE IMPACT VALUE (IS: 2386 Part - 4)

Proposed Use	DBM	**Date of Sampling**	**25-11-19**
Sample Location	At plant	**Date of Testing**	**25-11-19**

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	390.00	365.00	370.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	302.00	280.00	285.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	88.00	85.00	85.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	22.56	23.29	22.97	
5	Average Aggregate impact value	(%)	22.94			Max - 30 %

Remarks : ✓ Satisfactory / Not Satisfactory

M.N.D
AE(NS)

RAM & COMPANY

CONSULTANTS

Consultant's Representative

Assistant Executive Engineer,
Kodigenalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

TEJUS
CONSULTANTS

Project	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division
Client	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	M/s Tejus Consultants
Contractor	M/S Ram and Company, Engineers & Contractors

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Type of Material		DBM		Proposed Use	DBM
Sample Location		At plant		Date of Sampling	25-11-19
				Date of Testing	25-11-19
Size of aggregate		Flakiness Index		Elongation Index	
Passing through IS sieve, mm	Retained on IS sieve, mm	Total wt. of aggregate retained on sieves (A) gms.	Wt. of aggregate passing from Flakiness gauge (B) gms	Wt. of aggregate retained on Flakiness gauge (C) gms	Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	7830	690	7140	415
31.5	25.0	4610	200	3569	210
25.0	20.0	2355	310	1978	260
20.0	16.0	1270	330	1000	285
16.0	12.5	540	135	405	144
12.5	10.0	275	75	230	100
10.0	6.3	120	85	80	90
Total		**17000**	**1825**	**14402**	**1504**

Results:

Flakiness Index(%):	10.74
Elongation Index(%):	10.44
Combined FI+EL (%)	21.18

Consultant's Representative

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

TEJUS
CONSULTANTS

Name of Work	:	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division
Client	:	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	:	M/s Tejus Consultants
Contractor	:	M/S Ram and Company, Engineers & Contractors.
Date of Testing	:	25-11-19
Type of Mix	:	DBM
Sample I/D	:	DBM-1

GRADATION FOR DBM

(As per MORT&H 500-10,Grading-2)

Sample Location:	At plant	**Date of Sampling:**	25-11-19
		Date of testing:	25-11-19
Type of material & Purpose:	DBM	**Oven Dry Wt.(gms):**	1500.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
37.50	0	0	0.00	100.00	100.00
26.50	86	86	5.73	94.27	90-100
19.00	160	246	16.40	83.60	71-95
13.20	255	501	33.40	66.60	56-80
4.750	350	851	56.73	43.27	38-54
2.360	190	1041	69.40	30.60	28-42
0.300	215	1256	83.73	16.27	7-21
0.075	150	1406	93.73	6.27	2-8
Pan	94				
Total	1500.0				

M.D
AE(W)

RAM & COMPANY

Consultant's Representative

TEJUS CONSULTANTS

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

TEJUS
CONSULTANTS

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE BITUMINOUS MACADAM MIX		
Name of Work	:	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division
Client	:	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	:	M/s Tejus Consultants
Contractor	:	M/S Ram and Company, Engineers & Contractors.
Date of Testing	:	25-11-19
Type of Mix	:	DBM
Sample I/D	:	DBM-1

DETERMINATION OF BITUMEN CONTENT

Description	Trail 1	Trail 2
I. Weight of Mixture before extraction, g	869	892
II. Weight of Mixture after extraction, g	832	854
III. Weight of Bitumen	37	38
IV. Weight of filter paper before extraction, g	2.00	2.00
V. Weight of filter paper after extraction, g	4.00	4.00
VI. Weight of fines, g	2.00	2.00
VII. Weight of Bitumen & fines	39.00	40.00
VIII. Bitumen content in %	4.49	4.48
IX. Average Bitumen content in %	4.49	
X. Minimum Bitumen content in %	4.50	

GRADATION FOR DBM AFTER EXTRACTION

(As per MORT&H 500-10,Grading-2)

Sample Location:	At site	**Date of Sampling:**	25-11-19
		Date of testing:	25-11-19
Type of material & Purpose:	DBM	**Oven Dry Wt.(gms):**	832

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
37.50	0.0	0.0	0.00	100.00	100.00
26.50	45.0	45.0	5.41	94.59	90-100
19.00	135.0	180.0	21.63	78.37	71-95
13.20	115.0	295.0	35.46	64.54	56-80
4.750	145.0	440.0	52.88	47.12	38-54
2.360	105.0	545.0	65.50	34.50	28-42
0.300	140.0	685.0	82.33	17.67	7-21
0.075	115.0	800.0	96.15	3.85	2-8
Pan	32.0				
Total	832.0				

Consultant's Representative

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

TEJUS
CONSULTANTS

Name of Work	:	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division
Client	:	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	:	M/s Tejus Consultants
Contractor	:	M/S Ram and Company, Engineers & Contractors
Date of Testing	:	25-11-19
Type of Mix	:	Tack coat DBM
Sample I/D	:	3

DETERMINATION OF RATE OF SPREAD TACK COAT

Determination	**Unit**	**Test No**	
		1	**2**
Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30
Area of Plate (a)	Sq.mtr	0.09	0.09
Initial Wt of empty Plate (b)	Kg	0.825	0.775
Final weight of plate after application of tack Coat (c)	Kg	0.848	0.798
Weight of tack coat (d=c-b)	Kg	0.023	0.023
Rate of spread of tack coat	Kg/sq.m	0.256	0.256
Average	Kg/sq.m	0.256	
Specified Limit	Kg/sq.m	**0.250 Kg/sq.m**	

Consultant's Representative

Assistant Executive Engineer.
Kodigehalli Sub Division
Yelahanka Zone, B.B.M.P.
Bangalore.

TEJUS
CONSULTANTS

AGGREGATE IMPACT VALUE
(IS: 2386 Part - 4)

Project	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division		
Client	BRUHAT BANGALORE MAHANAGARA PALIKE		
Consultant	M/s Tejus Consultants		
Contractor	M/S Ram and Company, Engineers & Contractors.		
Proposed Use	BC	**Date of Sampling**	**28-11-19**
Sample Location	At plant	**Date of Testing**	**28-11-19**

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	395.00	380.00	382.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	306.00	296.00	295.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	89.00	84.00	87.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	22.53	22.11	22.77	
5	Average Aggregate impact value	(%)	22.47			Max - 30 %

Remarks : ✓ Satisfactory / Not Satisfactory

Note:
1. The report shall not be reproduced, except in full, without the written approval of the laboratory.
2. The results indicated above are based on the tests carried out on the samples received in the laboratory/Site.
3. Any Query regarding the report must be reported reported within 15days from the date of testing.

TEJUS CONSULTANTS

Authorised Signatory

RAM & COMPANY

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

TEJUS
CONSULTANTS

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Project :	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	M/s Tejus Consultants
Contractor:	M/S Ram and Company, Engineers & Contractors.

Type of Material	BC	**Proposed Use**	BC
Sample Location	At plant	**Date of Sampling**	**28-11-19**
		Date of Testing	**28-11-19**

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	620	70	550	65
16.0	12.5	1215	100	1115	85
12.5	10.0	510	80	430	65
10.0	6.3	512	60	452	60
Total		**2857**	**310**	**2547**	**275**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.85
Elongation Index(%):	10.80
Combined FI+EL (%)	21.65

Note:
1. The report shall not be reproduced, except in full, without the written approval of the laboratory.
2. The results indicated above are based on the tests carried out on the samples received in the laboratory/Site.
3. Any Query regarding the report must be reported reported within 15days from the date of testing.

Authorised Signatory

M/S RAM & COMPANY

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

TEJUS
CONSULTANTS

GRADATION FOR BC (As per MORT&H 500-18,Grading-2)				
Name of Work	:	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division		
Client	:	BRUHAT BANGALORE MAHANAGARA PALIKE		
Consultant	:	M/s Tejus Consultants		
Contractor	:	M/S Ram and Company, Engineers & Contractors.		
Date of Testing	:	28-11-19		
Type of Mix	:	BC		
Sample I/D	:	BC1		
Sample Location:	At plant		Date of Sampling:	28-11-19
Type of material & Purpose:	BC		Date of testing:	28-11-19
			Oven Dry Wt.(gms):	1200.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	140	140.0	11.67	88.33	79 - 100
9.50	110	250.0	20.83	79.17	71 - 95
4.75	225	475.0	39.58	60.42	53 - 71
2.360	125	600.0	50.00	50.00	42 - 58
1.180	122	722.0	60.17	39.83	34 - 48
0.600	110	832.0	69.33	30.67	26 - 38
0.300	120	952.0	79.33	20.67	18 - 28
0.150	88	1040.0	86.67	13.33	12 - 20
0.075	95	1135.0	94.58	5.42	4 - 10
Pan	65.0				
Total	1200.0				

Note:
1. The report shall not be reproduced, except in full, without the written approval of the laboratory.
2. The results indicated above are based on the tests carried out on the samples received in the laboratory/Site.
3. Any Query regarding the report must be reported reported within 15days from the date of testing.

M/S RAM & COMPANY

TEJUS CONSULTANTS

Authorised Signatory

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

TEJUS CONSULTANTS

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

Name of Work :	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	M/s Tejus Consultants
Contractor :	M/S Ram and Company, Engineers & Contractors.
Date of Testing :	28-11-19
Type of Mix :	BC
Sample I/D :	BC1

DETERMINATION OF BITUMEN CONTENT

Description	Trail 1	Trail 2
1. Weight of Mixture before extraction, g	960	910
2. Weight of Mixture after extraction, g	910	862
3. Weight of Bitumen	50	48
4. Weight of filter paper before extraction, g	2.00	2.00
5. Weight of filter paper after extraction, g	4.10	4.00
6. Weight of fines, g	1.40	1.40
7. Weight of Bitumen & fines	51.40	49.40
8. Bitumen content in %	5.35	5.43
9. Average Bitumen content in %	**5.39**	
10. Minimum Bitumen content in %	**5.40**	

GRADATION FOR BC AFTER EXTRACTION

(As per MORT&H 500-18,Grading-2)

Sample Location:	At site	Date of Sampling:	28-11-19
Type of material & Purpose:	**BC**	Date of testing:	28-11-19
		Oven Dry Wt.(gms):	910.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	92	92.0	10.11	89.89	79 - 100
9.50	118	210.0	23.08	76.92	71 - 95
4.75	135	345.0	37.91	62.09	53 - 71
2.360	120	465.0	51.10	48.90	42 - 58
1.180	110	575.0	63.19	36.81	34 - 48
0.600	75	650.0	71.43	28.57	26 - 38
0.300	80	730.0	80.22	19.78	18 - 28
0.150	60	790.0	86.81	13.19	12 - 20
0.075	65	855.0	93.96	6.04	4 - 10
Pan	55.0				
Total	910.0				

Note:
1. The report shall not be reproduced, except in full, without the written approval of the laboratory.
2. The results indicated above are based on the tests carried out on the samples received in the laboratory/Site.
3. Any Query regarding the report must be reported reported within 15days from the date of testing.

TEJUS CONSULTANTS

Authorised Signatory

RAM & COMPANY

Assistant Executive Engineer.
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P..
Bangalore.

TEJUS
CONSULTANTS

DETERMINATION OF RATE OF SPREAD TACK COAT				
Name of Work :	Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division			
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE			
Consultant :	M/s Tejus Consultants			
Contractor :	M/S Ram and Company, Engineers & Contractors.			
Date of Testing :	28-11-19			
Type of Mix :	Tack coat			
Sample I/D :	1			
Determination	**Unit**	**Test No**		
		1	**2**	**3**
Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30	0.30 x .30
Area of Plate (a)	Sq.mtr	0.09	0.09	0.09
Initial Wt of empty Plate (b)	Kg	0.831	0.820	0.815
Final weight of plate after application of tack Coat (c)	Kg	0.854	0.843	0.838
Weight of tack Coat (d=c-b)	Kg	0.023	0.023	0.023
Rate of spread of tack coat	Kg/sq.m	0.250	0.256	0.251
Average	Kg/sq.m	0.252		
Specified Limit	Kg/sq.m	**0.250 Kg/sq.m**		

Note:
1. The report shall not be reproduced, except in full, without the written approval of the laboratory.
2. The results indicated above are based on the tests carried out on the samples received in the laboratory/Site.
3. Any Query regarding the report must be reported reported within 15days from the date of testing.

M/S RAM & COMPANY

TEJUS CONSULTANTS

Authorised Signatory

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P
Bangalore.

TEJUS
CONSULTANTS

PAVER BLOCK(COBBLE STONE) TEST REPORT				
Client		Bruhat Bangalore Mahanagara Palike		
Contractor:		M/S Ram and Company, Engineers & Contractors.		
Name of Work:		Comprehensive Development for Roads and Drains In Ward No. 7 And 8 Under CMC & TMC Grants, Kodigehalli Sub-Division, Yelahanka Zone, Byatarayanapura Division.		
No.of Sample Tested:		3		
Date of Testing:		5/12/2019		
Techinical Reference:		IS:516-1959 (Reaffirmed 1999), SP-24:1983.		
Sl. No.	**Details**	**FLEXURAL STRENGTH, fcr in N/mm^2**	**Charecteristic Copressive strength fck in N/mm^2**	**Average Charecteristic Copressive strength fck in N/mm^2**
1	Paver Block	3.73	28.45	28.33
2	Paver Block	3.72	28.20	
3	Paver Block	3.73	28.35	

Results: Copressive strength of Paver Block(N/mm^2)=	**28.33**

Note:
1. The report shall not be reproduced, except in full, without the written approval of the laboratory.
2. The results indicated above are based on the tests carried out on the samples received in the laboratory.
3. Any Query regarding the report must be reported reported within 90 days from the date of testing.

Consultant's Representative

RAM & COMPANY

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.